WHAT IS CLAIMED IS:

1. A multiplexed medical carrier comprising:

a body having a surface and at least two lumens; and

at least two electrical conductors, each conductor disposed in a separate lumen along at least a portion of the body,

wherein the body is adapted to mount and electrically couple to the electrical conductors at least two separately identifiable effectors at a plurality of distributed locations within the body or on the surface.

2. A carrier as in claim 1, wherein the portion of the body comprises a distal portion of the body.

3. A carrier as in claim 1, wherein each of the at least two electrical conductors is uninsulated along at least a portion of the conductor to provide for electrical coupling of the conductor with the at least two effectors.

4. A carrier as in claim 1, further comprising a plurality of effectors mounted on the body and coupled to the electrical conductors.

5. A carrier as in claim 4, wherein at least some of the effectors comprise a transducer and a processor, wherein the processor is identifiable.

6. A carrier as in claim 5, wherein the transducer comprises a sensor.

7. A carrier as in claim 6, wherein the sensor is selected from the group consisting of pressure sensors, volume sensors, dimension sensors, temperature or thermal sensors, oxygen or carbon dioxide sensors, electrical conductivity sensors, electrical potential sensors, pH sensors, chemical sensors, flow rate sensors, optical sensors, acoustic sensors, hematocrit sensors, and viscosity sensors.

8. A carrier as in claim 5, wherein the transducer comprises an actuator.

9. A carrier as in claim 8, wherein the actuator performs a function selected from the group consisting of providing an electrical current or voltage, setting an electrical potential, generating a biopotential, pacing a heart, stimulating a muscle, stimulating one or more neurons, heating a substance or area, inducing a pressure change,

releasing or capturing a material, emitting light, emitting sonic or ultrasound energy and emitting radiation.

10. A carrier as in claim 5, wherein the transducer comprises both a sensor and an actuator.

11. A carrier as in claim 4, wherein at least some of the effectors comprise a transducer and an electronic conversion circuit, wherein output from the transducer is encoded using a carrier frequency and broadcast onto one of the electrical conductors, and wherein each effector utilizes a different carrier frequency.

12. A carrier as in claim 4, wherein at least some of the effectors comprise a transducer and an electronic conversion circuit, wherein output from the transducer is broadcast onto one of the electrical conductors during a specified time interval, and wherein each effector utilizes a different time interval.

13. A carrier as in claim 4, wherein the at least two electrical conductors comprise three electrical conductors electrically coupled to the effectors, each conductor disposed in a separate lumen along at least a portion of the body.

14. A carrier as in claim 14, wherein the three electrical conductors include a ground conductor, a power conductor, and a data conductor.

15. A carrier as in any of claims 4-14, wherein the effectors are mounted on an external surface of the body.

16. A carrier as in any of claims 4-14, wherein the effectors are mounted on an internal surface of the body.

17. A carrier as in any of claims 4-14, wherein the effectors contact the conductors through one or more holes in the body.

18. A carrier as in claim 17, wherein a conductive material is disposed within at least the portion of each of the at least two lumens, and wherein the effectors contact the electrical conductors via non-bonded connections with the conductive material.

19. A carrier as in claim 17, wherein each of the conductors comprises a conductive material disposed within at least a portion of each of the at least two lumens, and wherein the effectors contact the conductive material via non-bonded connections.

20. A carrier as in either of claims 18 and 19, wherein the conductive material is selected from the group consisting of a gel, a fluid, a paste and a slurry.

21. A carrier as in either of claims 18 and 19, wherein a bipolar alternating current is used to deliver power and signals across the conductive material.

22. A carrier as in claim 17, wherein a conductive material is disposed within at least the portion of each of the at least two lumens, and wherein the effectors contact the electrical conductors via non-bonded connections with the conductive material.

23. A carrier as in claim 22, wherein the conductive material is selected from the group consisting of a conductive epoxy, a weld, and a conductive eutectic.

24. A carrier as in claim 23, wherein a center frequency of the signals is between about 1000 Hz and about 10 MHz.

25. A carrier as in claim 24, wherein a center frequency of the signals is between about 100 kHz and about 10 MHz.

26. A carrier as in claim 18, wherein contacts with the conductive material comprise at least one electrically inert material or a coating thereof.

27. A carrier as in claim 18, wherein contacts with the conductive material comprise at least one chemically inert material or a coating thereof.

28. A carrier as in claim 27, wherein the chemically inert material is selected from the group consisting of platinum, iridium, gold and hafnium.

29. A carrier as in any of claims 4-14, wherein the body comprises an elongated body adapted to be introduced to and through a blood vessel.

30. A carrier as in claim 29, wherein the conductors extend axially from a distal location to a proximal location on the elongated body.

31. A carrier as in claim 30, wherein the effectors are spaced apart axially over a length of the catheter body.

32. A carrier as in any of claims 4-14, wherein the body comprises a flat surface adapted to be positioned on a body tissue.

33. A carrier as in claim 32, wherein the conductors are disposed along an adjacent flat surface coupled with the body.

34. An improved medical carrier of the type including a plurality of actuators, wherein the improvement comprises separately identifiable actuators that are multiplexed by at least one common conductor.

35. An improved medical carrier as in claim 34, wherein at least some of the actuators comprise electrodes for delivering electrical energy.

36. An improved medical carrier as in claim 34, wherein each of the actuators performs a function selected from the group consisting of providing an electrical current or voltage, setting an electrical potential, generating a biopotential, pacing a heart, heating a substance or area, inducing a pressure change, releasing or capturing a material, emitting light, emitting sonic or ultrasound energy, and emitting radiation.

37. An improved medical carrier as in any of claims 34-36, wherein the carrier comprises an intravascular or intracardiac catheter.

38. An improved medical carrier as in any of claims 34-36, wherein the carrier comprises an implantable carrier.

39. An improved medical carrier as in claim 38, wherein the implantable carrier is disposed on a cardiac pacing lead.

40. An improved medical carrier of the type including a plurality of systems, wherein the improvement comprises separately identifiable systems that are multiplexed by at least one common conductor, and wherein each system comprises:

at least one sensor;

at least one actuator; and

an electronic circuit.

41. A carrier as in claim 40, wherein the at least one sensor is selected from the group consisting of pressure sensors, volume sensors, dimension sensors, temperature or thermal sensors, oxygen or carbon dioxide sensors, electrical conductivity sensors, electrical potential sensors, pH sensors, chemical sensors, flow rate sensors, optical sensors, acoustic sensors, hematocrit sensors, and viscosity sensors.

42. A carrier as in claim 40, wherein each of the at least one actuators performs a function selected from the group consisting of providing an electrical current or voltage, setting an electrical potential, generating a biopotential, pacing a heart, heating a substance or area, inducing a pressure change, releasing or capturing a material, emitting light, emitting sonic or ultrasound energy, and emitting radiation.

43. A carrier as in claim 40, wherein at least one of the plurality of systems comprises:

an electrode sensor for measuring electrical potential; and

an electrode actuator for delivering electrical energy.

44. A system comprising:

a multiplexed medical carrier having a plurality of separately identifiable effectors distributed over a surface thereof, wherein the effectors are multiplexed by at least one common connector; and

a multiplexing controller adapted to connect to the effectors via the common conductor.

45. A system as in claim 44, wherein the multiplexing controller is adapted for wired connection to the multiplexed medical carrier.

46. A system as in claim 44, wherein the multiplexing controller is adapted for wireless connection to the multiplexed medical carrier.

47. A system as in claim 46, further comprising an implantable data collection and transmission unit which connects to the multiplexed medical carrier and wirelessly communicates with the multiplexing controller.

48. A method for configuring a medical carrier, the method comprising:

providing a body having a surface and at least one electrical conductor;

selectively mounting at least one separately identifiable effector on the surface; and

electrically coupling the at least one effector to the at least one electrical conductor through a surface penetration.

49. A method as in claim 48, wherein the providing step comprises providing the body coupled with a cardiac pacing lead.

50. A method as in claim 48, wherein the providing step comprises providing a body having at least two electrical conductors, each conductor disposed in a separate lumen along at least a portion of the body.

51. A method as in claim 50, wherein selectively mounting comprises mounting at least two separately identifiable effectors on the surface, and wherein the at least two effectors are electrically coupled to the at least two electrical conductors through one or more surface penetrations.

52. A method as in claim 48, wherein selectively mounting comprises exposing the at least one conductor through the surface and electrically coupling a lead from each of the at least one effector to the at least one conductor.

53. A method as in claim 48, wherein at least some of the effectors comprise a transducer and a processor, wherein the processor is identifiable.

54. A method as in claim 53, wherein the transducer comprises a sensor.

55. A method as in claim 54, wherein the sensor is selected from the group consisting of pressure sensors, volume sensors, dimension sensors, temperature or thermal sensors, oxygen or carbon dioxide sensors, electrical conductivity sensors, electrical potential sensors, pH sensors, chemical sensors, flow rate sensors, optical sensors, acoustic sensors, hematocrit sensors and viscosity sensors.

56. A method as in claim 54, wherein the transducer further comprises an actuator.

57. A method as in claim 53, wherein the transducer comprises an actuator.

58. A method as in either of claims 56 and 57, wherein the actuator performs a function selected from the group consisting of providing an electrical current or voltage, setting an electrical potential, heating a substance or area, inducing a pressure change, releasing or capturing a material, emitting light, emitting sonic or ultrasound energy and emitting radiation.

59. A method as in claim 48, wherein at least one of the effectors comprises both a sensor and an actuator.

60. A method as in claim 59, wherein the sensor is selected from the group consisting of pressure sensors, volume sensors, dimension sensors, temperature or thermal sensors, oxygen or carbon dioxide sensors, electrical conductivity sensors, electrical potential sensors, pH sensors, chemical sensors, flow rate sensors, optical sensors, acoustic sensors, hematocrit sensors and viscosity sensors.

61. A method as in claim 59, wherein the actuator performs a function selected from the group consisting of providing an electrical current or voltage, setting an electrical potential, heating a substance or area, inducing a pressure change, releasing or capturing a material, emitting light, emitting sonic or ultrasound energy and emitting radiation.

62. A method as in claim 48, wherein electrically coupling each of the at least one effector comprises coupling at least one lead to at least one conductor.

63. A method as in claim 62, wherein electrically coupling each of the at least one effector comprises coupling at least three leads to at least three conductors disposed in separate lumens of the body.

64. A method as in claim 63, wherein ground, power, and data leads on the effectors are connected to ground, power and data connectors in the body.

65. A method as in claim 48, further comprising encapsulating at least a portion of the body and the mounted effectors with an encapsulating material.

66. An improved method for configuring a medical carrier of the type including a plurality of actuators, wherein the improvement comprises providing separately identifiable actuators that are multiplexed by at least one common conductor.

67. An improved method for configuring a medical carrier of the type including a plurality of systems, wherein the improvement comprises providing separately identifiable systems that are multiplexed by at least one common conductor.

68. A method as in claim 67, wherein each system comprises:

at least one sensor;

at least one actuator; and

an electronic circuit.

69. A method for collecting medical data from a patient, the method comprising:

interrogating a network of multiplexed sensors residing on parallel conductors in the patient,

wherein interrogating comprises:

(a) addressing a first addressable sensor in the network to obtain data; and

(b) addressing a second addressable sensor in the network to obtain data.

70. A method as in claim 69, wherein interrogating further comprises:

(c) addressing a third addressable sensor in the network to obtain data; and

(d) addressing at least a fourth addressable sensor in the network to obtain data.

71. A method as in claim 69, further comprising powering sensors within the network of multiplexed sensors via the network.

72. A method as in any of claims 69-71, wherein the data obtained includes at least one of pressure data, volume data, dimension data, temperature data, oxygen or carbon dioxide concentration data, hematocrit data, electrical conductivity data, electrical potential data, pH data, chemical data, blood flow rate data, thermal conductivity data, optical property data, cross-sectional area data, viscosity data and radiation data.

73. A method as in claim 72, wherein sensors are distributed on a catheter present in one or more blood vessels or a heart chamber.

74. A method as in claim 72, wherein sensors are distributed on a flat surface present on or near brain tissue.

75. A method as in claim 72, wherein sensors are distributed in a catheter present in a urinary tract.

76. A method as in claim 72, wherein sensors are distributed on a catheter present in reproductive tract.

77. A method as in claim 72, wherein sensors are distributed on a catheter present in an endoscopic surgical site.

78. A method as in claim 72, wherein sensors are distributed on a catheter present in an abdominal cavity.

79. A method as in claim 72, wherein sensors are distributed on a catheter present in a gastrointestinal tract.

80. A method as in claim 72, wherein sensors are distributed on a catheter present adjacent a bone or in a joint space.

81. A method for collecting medical data from a patient, the method comprising:

activating a network of multiplexed sensors residing on parallel conductors in the patient such that each activated sensor transmits sensed data;

receiving the transmitted data; and

separating the received data into multiple data streams, each data stream comprising data from one sensor.

82. A method as in claim 81, wherein each activated sensor transmits data on a different carrier frequency.

83. A method for delivering energy or one or more substances to a patient, the method comprising addressing at least a first addressable actuator in a network of actuators to cause the first actuator to deliver energy or a substance.

84. A method as in claim 83, wherein activating further comprises addressing a second addressable actuator in the network of actuators to cause the second actuator to deliver energy or a substance

85. A method as in claim 84, wherein activating further comprises:

addressing a third addressable actuator in the network to cause the actuator to deliver energy or a substance; and

addressing at least a fourth addressable actuator in the network to cause the actuator to deliver energy or a substance.

86. A method as in claim 83, further comprising powering actuators within the network of multiplexed actuators via the network.

87. A method as in any of claims 83-86, wherein the actuators perform a function selected from the group consisting of providing an electrical current or voltage, setting an electrical potential, heating a substance or area, inducing a pressure change, releasing or capturing a material, emitting light, emitting sonic or ultrasound energy and emitting radiation.

88. A method as in claim 83, wherein actuators are distributed on a catheter present in one or more blood vessels or a heart chamber.

89. A method as in claim 83, wherein actuators are distributed on a flat surface present on or near brain tissue.

90. A method as in claim 83, wherein actuators are distributed in a catheter present in a urinary tract.

91. A method as in claim 83, wherein actuators are distributed on a catheter present in reproductive tract.

92. A method as in claim 83, wherein actuators are distributed on a catheter present in an endoscopic surgical site.

93. A method as in claim 83, wherein actuators are distributed on a catheter present in an abdominal cavity.

94. A method as in claim 83, wherein actuators are distributed on a catheter present in a gastrointestinal tract.

95. A method as in claim 83, wherein actuators are distributed on a catheter present adjacent a bone or in a joint space.